

Degree	Type	Year
Applied Microbiology	OB	0

Contact

Name: Carles Alonso Tarrés

Email: carles.alonso@uab.cat

Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

It is absolutely necessary to have a basic previous knowledge about microorganisms capable of causing human disease: habitat, transmission forms, type of infections caused and identification.

Objectives and Contextualisation

Objectives:

- a) to acquire abilities to apply own scientific knowledge to the clinical application of Microbiology
- b) to begin learning the methods of clinical reasoning in order to adapt to the healthcare setting and to the field of laboratories that supply equipment and reagents

Competences

- Continue the learning process, to a large extent autonomously.
- Design and apply scientific methodology in problem solving.
- Develop critical reasoning within the subject area and in relation to the scientific or business context.
- Display knowledge of the most up-to-date methodology used in environmental, molecular, industrial and clinical microbiology.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Interpret results from microbiological analyses in order to take appropriate decisions and propose solutions to biological problems in different areas.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use and manage bibliographic information and computer resources related to microbiology and related sciences.

Learning Outcomes

1. Apply appropriate methodologies for conducting studies on sensitivity to antimicrobial agents.
2. Continue the learning process, to a large extent autonomously.
3. Design and apply scientific methodology in problem solving.
4. Design identification strategies aimed at making a microbiological diagnosis in the field of clinical microbiology.
5. Design typification strategies aimed at conducting epidemiological studies in the field of clinical microbiology.
6. Develop critical reasoning within the subject area and in relation to the scientific or business context.
7. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
8. Integrate microbiological findings with clinical data in order to diagnose an infectious human disease microbiologically.
9. Interpret microbiological findings appropriately in order to take decisions regarding microbial identification, study of resistance to antibiotics and typifications. Write up the reports on the above analyses.
10. Know the appropriate methods for processing human samples for microbiological analysis.
11. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
12. Use and manage bibliographic information and computer resources related to microbiology and related sciences.

Content

- Introduction to medical reasoning
- Collection of specimens, transport and processing techniques
- Application of microbiological techniques to the clinical laboratory
- Main infection syndromes: pathogenesis, etiology and diagnosis

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	30	1.2	1, 10, 6, 4, 3, 8, 9, 11, 7, 2
On site exercises	15	0.6	6, 3, 8, 11, 7, 2, 12
Type: Supervised			
Clinical cases discussion	12.5	0.5	1, 6, 5, 4, 8, 9, 11, 7, 2
Problem based learning	5	0.2	1, 10, 6, 3, 8, 9, 11, 7, 2, 12
Written work	12.5	0.5	1, 10, 6, 3, 8, 9, 11, 7, 12
Type: Autonomous			
Personal study	72	2.88	1, 10, 6, 5, 4, 3, 8, 9, 11, 7, 2, 12

Learning method includes lecture lessons, clinical cases discussion, problem based learning, and personal study.

Power Point slides and text is given for every lecture. During lessons this material is enriched with real examples, taken from recent or past clinical cases.

In clinical sessions one or several cases are exposed and discussed according to clinical reasoning.

Problem based learning session has the objective to apply previous knowledge learned to solve a real clinical case. The oral presentation of the problem-solving process will be assessed.

For this subject, the use of Artificial Intelligence (AI) technologies is permitted exclusively for support tasks, such as bibliographic or information searches, text correction, or translations. The student must clearly identify which parts have been generated using this technology, specify the tools used, and include a critical reflection on how these have influenced the process and the final outcome of the activity. Lack of transparency in the use of AI in this assessed activity will be considered academic dishonesty and may result in a partial or total penalty in the grade for the activity, or more serious sanctions in severe cases.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance	10	0	0	1, 10, 6, 4, 3, 8, 11, 7
Problem based learning	40	0	0	1, 10, 6, 5, 8, 9, 11, 7, 2, 12
Written exam	50	3	0.12	1, 10, 6, 5, 4, 3, 8, 9, 7

Lectures and clinical cases will be evaluated in a written exam (50%). It is necessary to pass the exam in order to pass the course

Problem based learning will be evaluated with the compulsory attendance to the corresponding sessions, participation in class and oral exposition (40%).

Attendance to lessons will count 10%. 4 non-justified misses are allowed to get this 10%. From 5 misses on, every miss will discount 1/4 of this 10%.

Final considerations:

To be eligible for the retake process, the student should have been previously evaluated in a set of activities equaling at least two thirds of the final score of the course or module. Thus, the student will be graded as "No Avaluable" if the weighth in of all conducted evaluation activities is less than 67% of the final score. The oral presentation cannot be retaken.

Single assessment

Single assessment encompasses:

- Written exam (50%). Necessary to pass the whole subject.

- Problem based learning sessions (two) with oral exposition (50%)

Bibliography

REFERENCES

BIBLIOGRAFÍA

- 1) *Manual of Clinical Microbiology*. American Society for Microbiology. Jorgensen J et al. 13rd edition. ASM press. WashingtonDC. 2023. 12th edition available online at https://csuc-uab.primo.exlibrisgroup.com/permalink/34CSUC_UAB/avjicib/alma991009924369706709
 - 2) Sarah J. Pitt. *Clinical Microbiology for Diagnostic Laboratory Scientists*. 2017 John Wiley & Sons Ltd. Available at https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010353534106709
 - 3) Guillem Prats. *Microbiología y Parasitología Médicas*. Editorial Panamericana. 2nd edition 2022. Available at https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010879631306709
 - 4) Miller M, Miller S. *A Guide to Specimen Management in Clinical Microbiology*, Third Edition. 2017. Available at https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010346792906709
 - 5) Leber A. *Clinical Microbiology Procedures Handbook*. ASM Books. 2016. Available in the UAB's web: https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010432938606709
 - 6) Farreras-Rozman. *Medicina Interna*. 20th edition. Elsevier 2024. Available at the UAB's web: https://csuc-uab.primo.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package_service_i
 - 7) Harrison Principles of Internal Medicine. 21a edición. MacGraw Hill 2022. Spanish version available online at https://bibcercador.uab.cat/permalink/34CSUC_UAB/avjicib/alma991010637433606709
 - 8) *Molecular Medical Microbiology*. Tang, Yi-Wei ; Hindiyeh, Musa ; Liu, Dongyou ; Sails, Andrew ; Spearman, Paul ; Zhang, Jing-Ren ; Sussman, Max 2023. https://bibcercador.uab.cat/permalink/34CSUC_UAB/15r2rl8/cdi_askewsholts_vlebooks_9780323899925
- <http://www.isciii.es/> Web of the spanish center for infection control (*Instituto de Salud Carlos III*).
 - <https://www.escmid.org/#header>. European Society of Infectious Diseases and Clinical Microbiology
 - <http://www.asm.org/> American Society for Microbiology.
 - <http://www.microbelibrary.org/>. ASM's learning webpage.
 - <https://www.ecdc.europa.eu/en>. European center for infection control. Journal: <https://www.eurosurveillance.org/>
 - <http://www.cdc.gov/> and <http://www.cdc.gov/mmwr/index.html>. USA's Center for Disease Control and its journal (MMWR, *Morbidity and Mortality Weekly Report*).
 - <http://www.seimc.org/> Spanish Society of Infectious Diseases and Clinical Microbiology. Protocols: <https://www.seimc.org/documentos-cientificos/procedimientos-microbiologia/>
 - http://www.scmimc.org/?p=page/html/casos_clinics. Clinical cases of the Catalan Society for Clinical Microbiology and Infectious Diseases. Members only.
 - https://www.eucast.org/clinical_breakpoints/. European guide of antimicrobial resistance study methods

Software

- <http://www.pschreck.com/>. P.C. Schreckenberger's Microbiology Homepage. Bayesian Microbial identification. For gramnegative bacilli
- <https://apiweb.biomerieux.com/?action=prepareLogin>. Bayesian Microbial identification of Bio-Mérieux commercial system. Licence required. Will be shown in class.
- Calculator for Positive Predictive Value (PPV) and Negative Predictive Value (NPV) for individual tests and combined. <https://www.fda.gov/media/137612/download>

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAULm) Classroom practices (master)	1	Catalan/Spanish	first semester	afternoon
(TEm) Theory (master)	1	Catalan/Spanish	first semester	afternoon